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At the meeting held May 18, 1897, Dr. C. J. WHITE gave the results of his work on

"RINGWORM AS IT APPEARS IN BOSTON."

Up to a few years ago the dermatological world believed that all clinical forms of ringworm were caused by one and the same plant, but in 1893-4 Dr. ROBERT SABOURAND, of the St. Louis Hospital of Paris, published his admirable book entitled "Les Tricophyties Humaines," which entirely revolutionized our former simple ideas and set many continental observers at work to verify his assertions.

To summarize briefly, Sabourand's conclusions were these: He found that there were two distinct plants causing ringworm—one, the megalosporon, belonging to the Botrytis, so-called on account of its fructifying in grape-like clusters; and the other, the microsporon of Andouini, not a tricophyton at all, but a plant not yet placed by the mycologists.

The Megalospora, Sabourand divided in two groups according to their manner of growth, *i. e.*, whether the spores formed inside the hair or outside. These divisions he called megalosporon endothrix and megalosporon ectothrix. The former Sabourand never found upon the domestic animals, whereas the latter he isolated from cats, dogs, horses, pigs and birds. Of the endothrix variety, Sabourand found some to have a mycelium resistant to heat and others not, so that this characteristic formed a further subdivision.

Sabourand's results thus far had been gained by the microscope; he then invented a suitable medium for the growth of these plants and found that his cultural results coincided very closely with his microscopical.

My researches extend over two winters and my conclusions are based upon about two hundred microscopical examinations and between three and four hundred inoculations. In a few words my deductions are as follows:

The microsporon Andouini occurs in the majority of cases in ringworm of the scalp; in Boston 95 per cent. of all scalp cases are due to this plant, in Paris 60 per cent. and in London 80 to 90 per cent. This plant has never been found in the scalp of an individual after the age of fourteen years. In Paris this variety has not been isolated from the beard or from

the smooth skin, but in England it has been found in the beard and in Boston it occurred three times in the beard and three times on the body. Thus with us, it proves to be the commonest variety of ringworm, causing 56 per cent. of all cases of this disease.

The microsporon Andouini occurs always on the outside of the hair. The growth consists of innumerable small, round spores about 3 micromillimeters in diameter and it is only in the very newly infected hair that one can perceive any mycelium. The spores lie in a dense mass, the arrangement of which Sabourand aptly compared to a mosaic.

The megalospora occur both inside and outside the hair, and at times the whole shaft is invaded and surrounded. Here we find the spores varying in size from 5 to 7 micromillimeters. They are not round but rectangular and the mycelium is always visible. In Boston the mycelium has always proved itself resistant to heat, while in Paris this was not the case.

The medium which Sabourand concocted for his cultures is composed of Peptone 5 parts, Agar-agar 13, maltose 38, and water 1000. He found that in deviating from this formula impurities crept into the cultures in direct proportion to the decrease in the amount of maltose and the increase of the peptone.

This medium has proved a trying one in my hands as it has with English and German students. By this I mean that all depends on some unknown quality

in the different samples of maltose which came to us. With one bottle successes have been abundant, with another failures have been the rule and as this is an expensive material and the manufacture of the medium requires many consecutive hours of work I can show tonight the proportionately small successes of between three and four hundred inoculations. But I am glad to say that these positive results correspond fairly closely, as far as they go, with those of Sabourand of Paris and Colcott Fox of London.

In conclusion let me say a few works as to technique. For the quick examination of the specimens I should recommend placing a few drops of ether over the hair or the scale to remove the fat, and secondly a few drops of a 40 per cent. solution of caustic potash to dissolve the keratin. Place a cover-slip gently over the specimen and in a few minutes examine the slide with most of the light excluded. Don't mount in glycerine, for the refraction of the fungus and the glycerine is so nearly alike that the plant will be scarcely discernible.

For the staining and preservation of the specimen, Malcolm Morris of London recommends the following method which he claims is the best one yet devised, as it avoids the use of the hydrate of potash which he says must alter the shape and size of the spores :

1. Ether.
2. Solution of 5 per cent. gentian violet in 70 per

cent. alcohol. Five minutes required for the microsporon; one-half hour and heat for 5 minutes for the megalosporon.

3. Iodine solution.
4. Anilin oil, or 2 to 4 drops HNO_3 in anilin
5. Anilin.
6. Xylol.
7. Xylol balsam.

For the inoculation of the medium very little care is necessary. A very small scale or a small part of a hair is placed in the centre of a large flat surface of the medium, the cotton replaced and the Erlenmeyer flask put into the thermostat at a temperature of 37° C. One must not expect any signs of growth much before a week is passed.

Dr. E. H. Bradford addressed the society upon

"CONGENITAL DISLOCATION OF THE HIP."

Congenital dislocation of the hip differs from a traumatic dislocation in the fact that the capsule is not ruptured but stretched. The dislocation occurs in uterine life; the cause is unknown, attacking girls much more frequently than boys.

The pathological anatomy displays as the chief characteristic the alteration in the capsule, which is both stretched and thickened, especially on its anterior surface. As the head of the femur lies upon the dorsum, the stretched capsule, pulled upward by the

femoral head, covers the acetabulum, and becomes adherent to the ileum, where it lies in contact in the region around and above the edges of the acetabulum.

These adhesions form the thickness and strength of the capsule on its anterior aspect and form obstinate obstacles to reduction, and unless they are overcome it is impossible to replace the head thoroughly in the socket. In addition to this there is the shortening of the pelvi-femoral muscles, particularly the adductor group, distortion in the shape of the head of the femur, and a shallowness and alteration in the shape of the acetabulum are also present. The head is sometimes conical and sometimes irregularly flattened. The cartilaginous surface covering the head also varies.

The neck is twisted to an extent from twenty to forty degrees, and is less oblique than is normal. The cartilage which should cover the acetabulum is altered so that only a vestige remains around the rim. The cotyloid ligament is absent, the acetabulum is shallow and triangular in shape. There is no osseous formation to hold the head in its new position and the pelvis is slung to the top of the femur by the muscles and capsule in much the same way that an old-fashioned carriage is slung to the truck by leather straps. The gait becomes peculiar and as the patient grows heavy and old severe disability may follow.

The obstacles to successful treatment are many. First, the alterations in the bone, *i. e.*, the head, neck

and acetabulum. In young children the alterations in the anatomy of the bones do not present insuperable obstacles. Where an obliquity and twist of the neck of the femur exists the gait cannot be, after correction, as perfect at first as is desirable. This in growing children, however, will be overcome as the bone adapts itself to the normal conditions, and grow normally. Furthermore this can be largely corrected by a subsequent osteotomy if necessary.

The shallowness of the acetabulum will in young children also correct itself under the normal use of the joint, and this can also be said of the shape of the head. In adolescents, however, and in adults, this cannot be expected to take place, and the result will necessarily be imperfect.

The muscular shortening presents an obstacle to correction which can be overcome by mechanical means, either by incision or stretching.

The capsular contraction is of a special importance and is difficult to deal with in older children. It does not stretch readily, and does not yield to force in all instances. It is then necessary to divide the capsule and this should be done with the least destruction of muscular tissue, for it is largely upon free play of the muscles that the function of the joint depends. The necessary incision should be carefully made, and it should be born in mind that the portion of the capsule, which is especially resistant, is that portion on

the anterior and inner part of the joint, or that portion which runs from the ileum between the anterior-superior spine and the acetabulum passing down to the lesser trochanter, and portions of the femur in the spiral line. In other words, that portion which prevents a complete abduction and hyper-extension of the limb.

[Many lantern slides and dry preparations were shown.]

Dr. E. H. NICHOLS spoke upon

"THE PATHOLOGICAL ANATOMY OF CONGENITAL DISLOCATION OF THE HIP JOINT."

Illustrated by dry and wet preparations and lantern slides.

(From the Sears Pathological Laboratory of the Harvard Medical School.)

The following description of the anatomy of congenital dislocation of the hip joint is based entirely upon the examination of four specimens, including six joints, of this deformity. Two specimens (three joints), are the dried bones only; two specimens (three joints), are alcoholic preparations, and the ligaments and the essential muscles.

The Normal Hip Joint.—The acetabulum is a hemispherical cup, directed downward, outward and forward, bounded by an uneven rim thickest above. The head of the femur is globular, and directed upward, inward and forward. The neck of the femur joins the shaft at an angle of 130°. The shaft of the femur is

twisted on its long axis, the angle of torsion being about 25°. The fossa acetabuli is relatively small, filled with fat tissue, which is covered with synovial membrane. The capsular ligament is attached to the periphery of the acetabulum, and, externally to the base of the neck of the femur.

Pathological Anatomy.—From an examination of the six above-mentioned specimens it appears that:—

1. The anatomical conditions, as a whole, vary within considerable limits in individual cases.

2. Certain anatomical peculiarities, especially in the bones, are tolerably constant.

3. The acetabulum is triangular, shallow, and faces outward, and is insufficient to retain the head of the bone in place even if reduction is possible.

4. A new articular surface for the dislocated head of the femur is sometimes present upon the surface of the ilium.

5. The head of the femur is abnormally small and irregular in shape.

6. The neck of the femur is short, and makes nearly a right angle with the shaft.

7. The angle of femoral torsion is very much increased.

8. The shaft of the femur may show outward bowing.

9. The capsule is approximately hour-glass shaped. The upper dilatation is adherent to the surface of the

ilium and to the overlying glutei, and may be adherent to the head of the femur. The capsule is constricted at the middle, while the lower portion is dilated by the attachment of the fibres to the acetabulum.

10. The ligamentum teres is wanting in these cases.

11. The articular surface of the acetabulum is very small.

12. The capsule is thickened, especially above the acetabulum.

13. The muscles play a subordinate part.

The obstacles to reduction are due chiefly to the peculiar attachment of the capsule, above, laterally, or below. The muscles may offer slight resistance.

Difficulty in retaining the femur in place, if reduction is possible, may be due to a shallow acetabulum or to an extremely short neck.

Dr. J. L. GOODALE gave the results of experiments

"ON THE ABSORPTION OF FOREIGN SUBSTANCES BY THE FAUCIAL TONSILS IN THE HUMAN SUBJECT."

(From the Laboratory of the Massachusetts General Hospital.)

In 1895, B. Fraenkel, in a paper read before the Laryngological Section of the British Medical Association, called attention to the frequency with which acute lacunar tonsillitis follows trauma and inflam-

mation of the nasal mucous membrane. From this circumstance, and also on the theoretical grounds that a direct infection of the tonsil through its own epithelium could occur with difficulty against an outflowing stream of lymph and leucocytes, he concludes that in this class of cases at least, acute lacunar tonsillitis arises from a primary infection of the nasal mucous membrane transmitted to the tonsil by way of the lymph stream. His histological examinations showed the presence of bacteria in the tonsillar tissues as well as in the crypts.

An investigation of this hypothesis demands first, the determination of the question whether the tonsil is capable or not of absorbing into its interior, foreign substances lying in contact with its mucous membrane.

Although the tonsil is generally credited in the text books with possessing an absorbant power, yet so far as the writer is aware, this view has never been experimentally proved. Indeed, the experiments of Hodenpyl, the most complete hitherto on the subject, in which substances were applied to the free surface of the tonsils of lower animals, led him to conclude that the tonsil does not absorb through an intact mucous membrane.

In view of the great difference existing between the stout, compact mucous membrane covering the free surface of the tonsil, and the delicate loose character

of that lining the crypts, it appeared to the writer reasonable to expect that absorption, if it existed at all in the tonsil, would occur more readily through the latter than through the former. The following experments were therefore undertaken.

Foreign substances were introduced into the crypts of human tonsils, which were more or less hypertrophied and consequently demanded excision. After the substance had remained a given time in the crypts the tonsil was excised and portions of it immediately placed in corrosive. After paraffine-imbedding, serial sections were made through the crypts in question, stained, and examined. After much experimenting, carmine in aqueous suspension proved the most satisfactory substance for this purpose, owing to its insolubility, inert nature, extreme fineness, and conspicuous appearance. In sections stained with haematoxylon and aurantia, particles of carmine smaller than streptococcus pyogenes were easily recognizable. The carmine suspension was introduced into the crypts through a blunt pliable silver canula fitted to a hypodermic syringe.

SUMMARY OF RESULTS.

Twelve cases were thus examined. As a control, in two cases the tonsils were excised immediately after the introduction of the carmine. The other cases ranged as regards the time intervening, from twenty minutes to ten days.

Under the microscope the following appearances were noted:

Cases I and II.—Immediate excision after introduction of carmine. Carmine was present in abundance in the crypts, but had not in any place penetrated the mucous membrane.

Case III—Carmine in crypts twenty minutes.—Examination showed distinct lines of the finer carmine particles extending from the crypts into the mucous membrane for a variable distance, being deepest where the structure of the membrane was loosest. In a few places scattering particles of carmine were visible below the mucous membrane for a distance of two or three cell layers. Some of the polynuclear leucocytes in the crypts contained carmine particles in their interior.

Cases IV., V., VI., VII. and VIII. — Carmine in crypts for periods ranging from forty-five minutes to two hours.—Examination showed in all cases essentially similar appearances, namely, masses of carmine in the crypts, whence fine lines of carmine particles extend into the mucous membrane lying in the intercellular spaces in direct proximity to mononuclear and polynuclear leucocytes. Some of these latter contained carmine particles in their interior. In several places carmine particles were found sparingly below the mucous membrane for short distances.

Case IX. — Carmine in crypts two days. — Exam-

ination showed carmine masses chiefly in the deeper portions of the crypts. The intercellular spaces of the mucous membrane adjoining were filled with carmine particles, chiefly in linear arrangement. The lines of carmine extended below the mucous membrane between the follicles in the direction of the supporting fibrous trunks. In and immediately adjoining the mucous membrane the polynuclear leucocytes were unusually abundant, many being filled with carmine particles and in a state of nuclear fragmentation.

Cases X. and XI. — Carmine five days in crypts. — The appearances were essentially similar to those of the preceding cases, although in one the nuclear fragmentation of the polynuclear leucocytes in the neighborhood of the carmine was more pronounced.

Case XII. — Carmine in crypts ten days. — Examination showed few carmine particles in the crypts, but in the tonsillar tissue adjoing, very numerous and conspicuous lines of carmine situated in the interfollicular lymphatic spaces, extending from the crypts to the supporting fibrous trunks of the organ. The lines of carmine were arranged roughly parallel to each other, so that under a low power the appearance was presented of a carmine band. Little reaction was apparent on the part of the polynuclear leucocytes.

It was noted that the penetration of carmine particles was in the regions between the follicles, particles

not being found in the germ centers or in the interior of the follicles.

Sections of these cases were stained by Gram's method for bacteria, with positive results in all. The bacteria in every instance were limited in situation to the crypts, careful search failing to reveal any in or below the mucous membrane, except here and there in the most superficial layers, where they generally were in the interior of the polynuclear leucocytes. In case IX. the crypts contained enormous numbers of cocci and bacilli.

In connection with these experiments, solutions of anilin colors in normal salt solution were introduced into the crypts of living tonsils and allowed to remain one hour. The tonsil was then excised and sections cut by the freezing microtome. Examination showed a distinct penetration of the color into the mucous membrane and in places for a short distance below it.

In four cases of acute lacunar tonsillitis one or both tonsils were excised and sections examined by Gram's method for micro-organisms. Cocci were present in abundance in the crypts, but none were found in the tonsillar tissue itself except in the superficial layers of the epithelium.

The preceding investigations demonstrate that —

I. Absorption exists normally in the tonsils and takes place through the mucous membrane of the crypts.

II. The path of the absorbed substances is in the interfollicular lymph spaces in the direction of the larger fibrous trabeculae.

III. During the process of absorption, foreign substances encounter phagocytic action on the part of the polynuclear leucocytes situated in and adjoining the mucous membrane.

IV. Bacteria are normally present in the crypts of the tonsils, but are not, at least ordinarily, demonstrable in the tonsillar tissues proper.

V. In acute lacunar tonsillitis bacteria are greatly increased in numbers in the crypts, but do not necessarily occur in the tonsillar tissues, although, under certain conditions, as in Fraenkel's cases, they may do so.

In view of the preceding facts, the supposition appears possible that bacteria may be continually making their entrance into the tonsillar tissues, but at the moment of entering ordinarily encounter conditions which terminate their existence.

Furthermore, since it is not necessary for bacteria in acute lacunar tonsillitis to occur in the tonsil outside of the crypts, the possibllity is at once suggested that the inflammation of the tissues may be due to the absorption through the mucous membrane of irritating toxines formed in the crypts, as in a culture-tube.

Finally, while in some cases acute lacunar tonsillitis may, as by Fraenkel's hypothesis arise from a

primary infection of the nasal mucous membrane, yet the possibility is shown by these experiments that the tonsils may also become directly infected through the fluids of the mouth.

[My thanks are due to Dr. J. H. Wright, director of the laboratory of the Massachusetts General Hospital, under whose supervision the preceding work was performed; also, to Dr. Langmaid, surgeon for diseases of the throat, in the Children's Hospital, and to Drs. Coolidge and Clark, physicians for diseases of the throat, in the Massachusetts General Hospital, for kind permission to avail myself of the material in their clinics.]

Dr. H. F. Hewes gave the results of

"FIFTY NORMAL BLOOD COUNTS."

The number of red corpuscles in the blood of the normal adult averages in men 5,000,000 per cubic millimeter, in women 4,500,000 per cubic millimeter. The limits of normal variation lie between 4,000,000 and 6,500,000 for men, 3,700,000 and 5,200,000 for women. These figures are made up from the results of twenty-five sets of investigations made by separate observers with modern methods.

Of these twenty-five sets of observations, 10 are German, 5 French, 3 Austrian, 4 Russian (Dorpat), 2 Danish, 1 Italian.

The average of the German observations is 5,180,000, of the Austrian 4,880,000, of the French 4,600,000.

As far as I know no observations in regard to this subject have been reported in England or America.

The investigation of which I wish to report the results, consists of the counts of the number of red corpuscles in the blood of 50 healthy individuals. The subjects were all young men between the ages of 18 and 25 years. They were all of American birth.

My method in each case was as follows:

The blood was obtained between the hours of 11 and 1 A. M.

The specimen was drawn from the ear with all necessary precautions, diluted, and counted at once

The diluting fluid used was Gowers' Solution, consisting of Sodium Sulphate gr. CXII, acetic acid ʒv, water ℥iv.

The count was made with the Thoma-Zeiss instrument.

In each case 2,000 or more corpuscles were counted on each of two slides.

The results of the 50 counts are as follows:

The average of all the counts is 5,809,000 corpuscles per cubic millimeter.

The minimum count was 5,120,000.

The maximum count 6,400,000.

Fifteen counts exceeded 6,000,000.

These results fall within the limits made up from the European observations. The average is higher than any of the reported averages, but this is natural in view of the fact that my subjects were all young men.

Three sets of observation upon the blood of young men are reported. One in Germany by Graeter, two in France by Hayem and Patrigeon. Graeter found the limits of variation in his cases as between 4,405,-000 and 6,100,000. Patrigeon gives the limits in his cases as between 5,000,000 and 6,000,000 Hayem gives the limits in his cases as between 5,060,000 and 6,100,000.

The results in my cases are in practical accord with these recorded observations on youths.

Dr. H. C. Ernst demonstrated the new Zeiss 1a microscope stand, loaned for the occasion by Mr. Francis Blake.

(*Correction:* On page 7, line 4, of number 11, insert "the stimulation of" between "of" and "muscle"; on page 8, line 7, for "on" read "or".)

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